[Book review of:] Statistical Intervals: A Guide for Practitioners and Researchers. Second Edition. Wiley Series in Probability and Statistics

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Criticality, a biologist would probably be more interested in the Bak-Sneppen evolutionary model than an earthquake model. Finally, the instances of animal collective behavior motivating the first flocking models would probably resonate more with biologists than the book's mosh pit example; and classic animal coat patterns or more recent vegetation pattern models are probably more appealing than models for chemical reactions. Some of these examples are briefly mentioned, which speaks about the generality that the author aims for and achieves. Still, these brief comments are not enough for uninitiated biologists to easily connect the examples from the volume (approached from a physics perspective) with more appealing biological systems. But, again, it was never Charbonneau's intention to make this a complex systems handbook for biologists. This is an excellent choice for physics students and readers interested in an abstract, generalistic first contact with complexity. However, biologists can find more tailored options already available in the literature.

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STATISTICAL INTERVALS: A GUIDE FOR PRACTITIONERS AND RESEARCHERS. *Second Edition. Wiley Series in Probability and Statistics.*

By William Q. Meeker, Gerald J. Hahn, and Luis A. Escobar. Hoboken (New Jersey): Wiley. $110.00. xxxv + 592 p.; ill.; index. ISBN: 978-0-471-68717-7 (hc); 978-1-118-59516-9 (eb). 2017.

This is the second edition of a book on statistical intervals written by the first two authors and published in 1991 (New York: Wiley). Like the first edition, it has a clear focus on constructing confidence, prediction, and tolerance intervals. Yet, this new edition is much more than an update. Seven out of the 18 chapters are basically new and account mainly for the popularity that simulation-based statistical intervals have gained since the first edition. However, the audience is still the same: practitioners who need to draw conclusions from data and applied statisticians. Although the audience remains the same, the new Chapters 12–18 are different in nature than the updated Chapters 3–10. The latter focus on presenting formulas that can be directly used to construct statistical intervals, but the new chapters mainly introduce and explain methods that need either a statistical software product or to be implemented by researchers.

In general, one might argue that a volume with a focus on formulas and simulation-based methods, many of which are already implemented in statistical software products, is outdated. This might be true for some books, but it is definitely not true for this publication because it contributes in many ways to good statistical practice. Chapter 1 is an informative yet concise introduction to statistical inference and its assumptions about the sample data. Here and in later chapters the authors do a very good job of reminding readers about the assumptions underlying the inferential procedures presented. Chapter 2 gives an overview on statistical intervals. It explains the different intervals, provides guidance on how to interpret them, and discusses related issues such as confidence levels. Chapters 3 and 4 describe intervals for the normal distribution. Here, as throughout the book, the formulas are accompanied by examples that illustrate how they are applied to data sets. The sections of Chapter 4 that provide tools for checking the normality assumption and explain how transformation techniques can be applied to nonnormally distributed data are very useful. Chapters 6 and 7 introduce intervals for binomial and Poisson distributions. Although the methods in these chapters are only valid if the distribution of the data is correctly specified, the intervals discussed in Chapter 5 are valid whatever the distribution of the data, i.e., the intervals of Chapter 5 are distribution-free. Chapters 8, 9, and 10 discuss sample size requirements for the intervals introduced in the preceding chapters. The likelihood-based methods of Chapter 12 allow researchers to construct intervals for other distributions than those discussed in Chapters 3, 4, 6, and 7. Chapters 13 and 14 introduce bootstrap methods. Chapters 15–17 present and illustrate Bayesian methods in a self-contained way that enables readers to employ the intervals presented. However, the authors do not provide a thorough discussion of the conceptual differences between frequentist and Bayesian methods. Chapters 11 and 18 contain case studies that will be very valuable for practitioners. In my view this is a very instructive book for all practitioners who need ready-to-use methods for statistical intervals presented in a way that eases their interpretation and highlights their applicability.

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ZOOLOGY

AMAZING ARACHNIDS.

By Jillian Cowles. Princeton (New Jersey): Princeton University Press. $45.00. 328 p.; ill.; index of common and scientific names. ISBN: 978-0-691-17658-1. 2018.

Venomous predators, blood-sucking parasites, or diminutive specks beneath notice, spiders and other arachnids are all too often unfairly maligned or over-